

## Air Quality Permit

Issued to: US Air Force - Malmstrom AFB	Permit #1427-07
341 CES/CEVC	Application Complete: 03/25/04
39 - 78th Street North	Preliminary Determination Issued: 05/03/04
Malmstrom AFB, MT 59402-7536	Department's Decision Issued: 05/19/04
	Permit Final: 06/04/04
	AFS #013-0016

An air quality permit, with conditions, is hereby granted to the United States Air Force – Malmstrom Air Force Base (Malmstrom), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM), 17.8.701, *et seq.*, as amended, for the following:

### SECTION I: Permitted Facilities

#### A. Plant Location

The Malmstrom base is located primarily in Township 20 North, Range 4 and 5 East, in Cascade County. The facility is contained within approximately 3,159 acres located on the eastern edge of the City of Great Falls, Montana.

#### B. Current Permit Action:

On March 25, 2004, the Montana Department of Environmental Quality (Department) received a complete permit application to modify Malmstrom's air quality Permit #1427-06. Malmstrom proposed process changes to current operations at heating plant boilers #1 and #3. The proposed changes include the following:

- Replacement of the existing motors driving the induced draft fans with new variable frequency drive motors.
- Replacement of the existing ash unloading system with a new ash unloading system.
- Modification of exhaust gas ductwork to increase spray dryer absorber (SDA) control efficiency of sulfur dioxide (SO<sub>2</sub>) emissions.
- Installation of ductwork to provide effluent heat to the opacity monitors for the purpose of decreasing false increased opacity readings during foggy weather conditions.
- Removal of the existing 35 million British thermal unit per hour (MMBtu/hr) heat input capacity natural gas-fired burner from Boiler #1 and replacement of this burner with two 25 MMBtu/hr heat input capacity natural gas-fired low NO<sub>x</sub> burners.
- Installation of two 25 MMBtu/hr heat input capacity natural gas-fired low NO<sub>x</sub> burners on Boiler #3.
- Installation of a load simulator for the purpose of testing and evaluating the new low NO<sub>x</sub> burners described above.

As detailed in a Department internal file memorandum dated January 16, 2004, and subsequent Department correspondence to Malmstrom dated March 15, 2004, the Department determined that Malmstrom is a major source as defined under the New Source Review (NSR) permitting program. However, potential emissions from the above detailed modifications would be below the NSR – Prevention of Significant Deterioration (NSR/PSD) significance threshold for all pollutants. Therefore, the current permit action

is not subject to NSR/PSD review. An emission inventory detailing potential emissions from the proposed project is included in Section IV of the permit analysis to this permit.

## SECTION II: Limitations and Conditions

### A. Emission Limitations

1. Malmstrom shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any of the three heating plant boilers or the coal handling baghouse that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).
2. Particulate emissions from any of the three heating plant boilers shall not exceed 4.0 lbs/hour (ARM 17.8.752).
3. SO<sub>2</sub> emissions from any of the heating plant boilers shall not exceed (ARM 17.8.752):
  - a. 0.320 lb/MMBtu; or
  - b. 33.9 lb/hour.
4. NO<sub>x</sub> emissions from any of the heating plant boilers shall not exceed (ARM 17.8.752):
  - a. 0.50 lb/MMBtu; or
  - b. 53 lb/hour.
5. Total heat content of the fuel combusted (coal + natural gas) in the three heating plant boilers during any rolling 12-month time period shall not exceed 999,000 MMBtu. Total BTUs combusted shall be determined on a monthly basis using the following equation (ARM 17.8.710):  
  
Total BTUs Combusted = (A x B) + (C x D)  
  
Where: A = Natural gas combusted (MMscf)  
B = Average heat content of the natural gas (Btu/MMscf)  
C = Coal combusted (tons)  
D = Average heat content of the coal (Btu/ton)
6. Maximum operating level of the three heating plant boilers combined shall not exceed 212 MMBtu/hour heat input (ARM 17.8.749).
7. A dry lime scrubber and baghouse shall be used on each heating plant boiler when combusting coal (ARM 17.8.752).
8. Malmstrom shall not emit from the coal handling baghouse, particulate matter in excess of 0.02 gr/dscf (ARM 17.8.752).
9. A baghouse shall be used to control emissions from the coal handling system (ARM 17.8.752).
10. Malmstrom shall not cause or authorize emissions to be discharged to the atmosphere from coal storage and handling that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

11. Malmstrom may combust coal and/or natural gas in heating plant boiler #1 and heating plant boiler #3 (ARM 17.8.749).
12. Malmstrom shall combust only natural gas in heating plant boiler #2 (ARM 17.8.749).
13. Malmstrom shall obtain a coal analysis, which is representative of each load of coal received, from each coal supplier. The analysis shall contain, at minimum, sulfur content, ash content, and BTU value (ARM 17.8.749).
14. Malmstrom shall not cause or authorize to be discharged into the outdoor atmosphere from the classified document incinerator, particulate matter in excess of 0.10 grains per standard cubic foot of dry flue gas, adjusted to 12% carbon dioxide and calculated as if no auxiliary fuel had been used (ARM 17.8.316).
15. Malmstrom shall not cause or authorize to be discharged into the outdoor atmosphere from the classified document incinerator emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes (ARM 17.8.316).
16. Malmstrom shall utilize fuel storage tanks H-1 and H-2 to store only JP-8 jet fuel or a similar jet fuel with a vapor pressure <3.5 kPa (ARM 17.8.749).
17. An internal floating roof shall be operated on each tank listed in Section I.B.5 of the permit analysis (ARM 17.8.752).
18. Malmstrom shall not combust any hospital/medical/infectious waste, as defined in 40 CFR 60, Subpart Ce, at their facility (ARM 17.8.749).
19. The Building 780 emergency/back-up diesel generator shall only be operated during periods when electric power from the local utility is interrupted or as necessary for routine maintenance of the generator (ARM 17.8.749).

B. Testing Requirements

1. Malmstrom shall conduct source testing for SO<sub>2</sub>, particulate, and opacity on boilers #1 and #3 and demonstrate compliance with the emission limits contained in Section II.A.1 through 3. The above testing shall be performed while the boilers are being fired exclusively on coal. Compliance source testing shall be performed on a once every 5-year basis or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.749 and ARM 17.8.105).
2. Malmstrom shall provide the Department with a record of the amount of coal being combusted and a coal analysis for sulfur and BTU value during all compliance source tests on the heating plant boilers (ARM 17.8.749 and ARM 17.8.106).
3. All compliance source tests shall be conducted in accordance with the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).
4. Source testing on the classified document incinerator shall be conducted in accordance with ARM 17.8.316 and the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

5. The Department may require further testing (ARM 17.8.105)

C. Operational and Emission Inventory Reporting Requirements:

1. Malmstrom shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis, and sources identified in Section I of the permit analysis.

Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall include the information listed below and shall be in the units as required by the Department (ARM 17.8.505).

- a. Tons of coal combusted in heating plant boilers #1 and #3, respectively.
- b. Million cubic feet of gas combusted in heating plant boilers #1, #2, and #3, respectively.
- c. Tons of coal delivered to the facility.
- d. Tons of coal processed through the coal handling system.
- e. Sulfur analysis for coal combusted during the past calendar year.
- f. Tons of ash removed from the facility.
- g. Tons of material combusted in the classified document incinerator.
- h. Million cubic feet of natural gas used to fire the classified document incinerator.
- i. Gallons of JP-8 throughput.
- j. Vehicle miles traveled on haul roads, type of vehicle category, and percent of roads paved.
- k. Gallons of diesel used in haul vehicles and unloaders.
- l. Fugitive dust information consisting of a listing of all plant vehicles including:
  - i. Vehicle type;
  - ii. Vehicle weight;
  - iii. Number of tires on vehicle;
  - iv. Average trip length;
  - v. Number of trips per day;
  - vi. Average vehicle speed;
  - vii. Area of activity; and
  - viii. Vehicle fuel usage (gasoline or diesel) - annual total.

If the information on vehicle size has not changed over the past year, Malmstrom only needs to supply the vehicle type and the vehicle miles traveled (VMT) by each vehicle type as required in Section II.C.1.j and k. If changes occur, Malmstrom shall supply the information in Section II.C.1.l for the changed vehicles.

2. Malmstrom shall document the total Btu value of the fuel combusted in the three heating plant boilers, based on the equation in Section II.A.5. Further, by the 25<sup>th</sup> day of each month, Malmstrom shall total the fuel combusted during the previous 12 months to verify compliance with the limitation in Section II.A.6. A written report of the compliance verification shall be submitted to the Department annually. The report for the previous calendar year shall be submitted no later than March 15 and may be submitted along with the annual emission inventory

(ARM 17.8.749).

3. Malmstrom shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745, that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit.

The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).

4. Malmstrom shall document, by month, the hours of operation of the Building 780 emergency/back-up power generator at the facility. By the 25th day of each month, Malmstrom shall total the hours of operation for the Building 780 emergency/back-up diesel generator during the previous 12 months to verify compliance with emergency/back-up status requirements. A written report of compliance verification shall be submitted along with the annual emission inventory (ARM 17.8.749).
5. All records compiled in accordance with this permit must be maintained by Malmstrom as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

#### D. Notification

Malmstrom shall provide the Department with written notification of the following dates within the specified time periods (ARM 17.8.749):

1. All compliance source tests as required by the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).
2. Anticipated date of commencement of modification of heating plant boilers #1 and #3 to install the new natural gas-fired low NO<sub>x</sub> burners within 30 days of commencement of the modification (ARM 17.8.749).
3. Actual completion of modification to heating plant boilers #1 and #3 to install the new natural gas-fired low NO<sub>x</sub> burners within 15 days of actual start up of the modified heating plant boilers #1 and #3 (ARM 17.8.749).

### Section III: General Conditions

- A. Inspection – Malmstrom shall allow the Department’s representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.
- B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed

accepted if Malmstrom fails to appeal as indicated below.

- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Malmstrom of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.* (ARM 17.8.756).
- D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement action as specified in Section 75-2-401, *et seq.*, MCA.
- E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The Department's decision on the application is not final unless 15 days have elapsed and there is no request for a hearing under this section. The filing of a request for a hearing postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board.
- F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy the air quality permit shall be made available for inspection by the Department at the location of the source.
- G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by Malmstrom may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.
- H. Construction Commencement – Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked (ARM 17.8.762).

Permit Analysis  
United States Air Force - Malmstrom Air Force Base  
Permit #1427-07

I. Introduction/Process Description

A. Facility Description

The United States Air Force – Malmstrom Air Force Base (Malmstrom) is contained within approximately 3,159 acres, and is located in Township 20 North, Ranges 4 and 5 East, Sections 1, 2, 3, 10, 11, 12, 13, 14, and 15, in Cascade County. Malmstrom is located on the eastern edge of the City of Great Falls, Montana.

Malmstrom was established in 1942, and currently houses the 341<sup>st</sup> Missile Wing. The base itself contains the facilities necessary for all of its military and non-military personnel, which currently number between 4,000 and 5,000. The greatest stationary source of air contaminants at Malmstrom are the three heating plant boilers, although several other miscellaneous smaller sources of emissions are present at the base.

B. Permitted Equipment:

1. Heating Plant Boiler #1 (boiler #1), with dry lime scrubber and baghouse.
2. Heating Plant Boiler #2 (boiler #2), with dry lime scrubber and baghouse.
3. Heating Plant Boiler #3 (boiler #3), with dry lime scrubber and baghouse.
4. Classified Document Incinerator
5. Two 210,000-gallon aboveground fuel storage tanks (H-1 and H-2).
6. Two 2.1 million British thermal unit per hour (MMBtu/hr) heat input capacity boilers in Building 1075.
7. Various emergency/back-up diesel-fired emergency generators.

C. Permit History

Permit #1427 was issued to Malmstrom on October 28, 1980. The application required a Prevention of Significant Deterioration (PSD) review by the state of Montana for SO<sub>2</sub>, particulate, and NO<sub>x</sub>. The application was deemed complete September 4, 1979. The application was for the construction of a new heating plant at Malmstrom. Malmstrom proposed three high temperature hot water generators (heating plant boilers #1, #2, and #3) to be used as a heating plant for the base. Each boiler was rated at 85 MMBtu heat output per hour, with an input design capacity of 106.25 MMBtu/hr. Malmstrom identified that the three boilers would be capable of combusting coal. Two of the boilers would also have natural gas capabilities. The coal would generally be used only during the coldest periods of the year. At other times, the boilers would be operated using natural gas.

The Department of Environmental Quality (Department) determined the boilers are not subject to New Source Performance Standards (NSPS) because the size of the boilers is below the cutoff size contained in Subpart D and Da and the date of installation is before the effective date for Subpart Dc. Also, the "boilers" did not actually produce steam, they produce hot water.

Malmstrom was also required to obtain an EPA PSD permit for this project since the state of Montana did not have a fully approved program at the time the permit application was processed. The **EPA PSD Permit** was issued pursuant to 40 CFR 52.21 (as amended 43 FR 26388). This permit was issued June 1, 1981. The EPA PSD permit contains emission limits. One of the limits stated that the maximum operating level of the system could not be greater than the combined capacities of any two of the three boilers operating simultaneously.

In 1994, Malmstrom requested a permit alteration to remove the 85% control efficiency requirement contained in Permit #1427. The permit application was given Permit **#1427-01**. An incompleteness letter was sent to Malmstrom. Malmstrom chose not to respond and to have the application withdrawn. The application was withdrawn by Malmstrom and Permit #1427-01 was not issued.

**Permit #1427-02** accomplished numerous permitting goals at Malmstrom. Specifically, the requirement that the dry scrubbers maintain a control efficiency of 85% for SO<sub>2</sub> was removed. That level of efficiency was not practical when the facility burned low sulfur coal or operated at low loads. Because the emissions under this scenario were below the limits identified in the Department permit, the Department determined the SO<sub>2</sub> emission limits contained in the permit were sufficient to maintain the ambient air quality of the area. Permit #1427-02 also identified the fuels each of the boilers were capable of burning.

In addition, Permit #1427-02 allowed Malmstrom to bypass the scrubbers and baghouses on the boilers during start up, until the scrubber inlet temperature reached approximately 350°F. At temperatures below this level, the moisture in the lime slurry would not be completely evaporated and would cause blinding of the bags. All emission limits were still in effect during periods of scrubber bypass.

Further, Permit #1427-02 authorized the modification of the #1 boiler to enable the boiler to fire coal and natural gas simultaneously. Prior to Permit #1427-02, the boiler could not physically fire both fuels at once. The permit also established limits for NO<sub>x</sub> emissions and modified the SO<sub>2</sub> limits for the boilers. The SO<sub>2</sub> emission limit was changed from 37 lb/hour to 33.8 lb/hour and a limit of 0.320 lb/MMBtu was added to be consistent with the BACT determination at the time of EPA's PSD permit issuance. The permit also limited the total fuel consumption for the boilers. The fuel consumption limitation (along with the NO<sub>x</sub> and SO<sub>2</sub> limits) ensured that emissions of any pollutant from the three boilers would be less than 250 tons/year, or less than the PSD major-source permitting threshold. Therefore, the installation of the boilers was not subject to the requirements of the PSD program and it was possible for EPA to revoke the PSD permit issued on June 1, 1981.

Permit #1427-02 also included the medical waste incinerator and the classified document incinerator to the list of permitted equipment on the base. Even though a permit was not required by the state at the time of construction, the Department determined a permit was necessary to meet the requirements of the Administrative Rules of Montana (ARM) 17.8.705 and for Malmstrom to operate the incinerators. The conditions applicable to the incinerators were included as part of that permit action.

Finally, Permit #1427-02 included the tanks installed in 1987, which Malmstrom was not required to permit at the time of construction. The Department determined that a permit was necessary to meet the requirements of ARM 17.8.705 and to operate the tanks. The conditions applicable to the tanks were included as part of the permit.



On July 17, 1996, the Department received information regarding minor facility changes. The facility changes were assigned Permit #1427-03. Subsequent to receipt of this information, the Department determined that the facility changes did not require any permit action. Therefore, Permit #1427-03 was not issued.

Permit Modification #1427-04 removed the Medical Waste Incinerator from Malmstrom's permit. Disposal of the medical red bag waste was to be accomplished through a private contractor, and the gas supply for the incinerator was disconnected.

In addition, Permit Modification #1427-04 removed two large fuel storage tanks (S-1 and S-2), subject to 40 CFR Part 60, Subpart Kb, from Malmstrom's permit and emission inventory. Malmstrom decommissioned the two large (1,050,000 gallons each) aboveground fuel storage tanks (S-1 and S-2) with the relocation of the 43<sup>rd</sup> Air Refueling Group. The remaining tanks (H-1 and H-2) were each 210,000-gallon and primarily supported the helicopters used by the 341<sup>st</sup> missile wing.

Further, the permit modification established a new testing campaign to begin by January 31, 2001, and to perform compliance testing on a once-every 4-year basis thereafter. Malmstrom requested a one-year extension to conduct emission testing on the base's heating plant boilers. The reasoning behind the request was that the boilers (Coal-fired) located at Malmstrom were selected for outsourcing and were to be operated by a private (non-government) contractor. The contractor that was awarded the bid for services began operation of the facilities on January 15, 2000.

Permit Alteration #1427-04 resulted in an overall decrease in the allowable emissions from the facility. Permit #1427-04 replaced Permit #1427-02.

On December 22, 1999, the Department received a request from Malmstrom for modification of Permit #1427-04. Condition II.A.18 in Permit #1427-04, regarding jet fuel storage tanks H-1 and H-2, required that Malmstrom comply with 40 CFR Part 60, Standards of Performance for New Stationary Sources, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels. However, based on information in the permit modification request, the Department determined that changes in Air Force policy and practice made 40 CFR Part 60, Subpart Kb, no longer applicable to jet fuel storage tanks H-1 and H-2.

Section I.B.5 of the permit analysis to Permit #1427-04 listed two 210,000-gallon storage tanks used for the storage of JP-4 and JP-8 jet fuel. Because of the physical characteristics of JP-4 jet fuel, and because Malmstrom had the option of storing JP-4 jet fuel in storage tanks H-1 and H-2, the tanks were subject to the requirements of 40 CFR Part 60, Subpart Kb. However, changes in Air Force policy dictated that the Air Force no longer utilize JP-4 jet fuel. Instead, Malmstrom reverted to the storage and use of JP-8 jet fuel only in the two affected storage tanks. JP-8 jet fuel has a vapor pressure <3.5 kPa; therefore, storage of JP-8 or a similar jet fuel with a vapor pressure <3.5 kPa rendered the jet fuel storage tanks H-1 and H-2 as non-affected sources under 40 CFR Part 60, Subpart Kb, 60.110b. Therefore, the fuel storage tanks H-1 and H-2 were no longer subject to the requirements of 40 CFR Part 60, Subpart Kb.

The permit action removed permit condition II.A.18 in Permit #1427-04 and relieved Malmstrom from the responsibility of compliance with 40 CFR, Subpart Kb for jet fuel storage tanks H-1 and H-2. Further, the permit action added, in place of permit condition II.A.18 in Permit #1427-04, a condition requiring the storage of only JP-8 jet fuel or a similar jet fuel with a vapor pressure <3.5 kPa. Finally, the permit action updated the

equipment list in Section I.B of the permit analysis to Permit #1427-04 to properly identify the 210,000-gallon fuel storage tanks H-1 and H-2 and change the name of the boilers from High Temperature Hot Water Generators #1, #2, and #3 to Heating Plant Boilers #1, #2, and #3. Permit #1427-05 replaced Permit #1427-04.

On November 26, 2002, the Department received a request for permit modification from Malmstrom. On August 28, 2002, the Department received a copy of a letter, dated November 5, 2001, from Malmstrom requesting a permit determination. The Department was unable to find any record of this letter being received on or around November 5, 2001. The permit determination request was for the removal of the existing Building 1075 natural gas fired boiler rated at 11.954 MMBtu/hr heat input capacity and replacement of the existing unit with two smaller 2.1 MMBtu/hr heat input capacity units. Because potential emissions from the replacement boilers were less than the de minimis threshold of 15 tons per year (tpy) for any regulated pollutant, the Department determined that the changes were accomplished in accordance with ARM 17.8.745(1).

The letter received by the Department on November 26, 2002, also indicated that Malmstrom intended to install and operate a 200-kilowatt (kW) emergency diesel generator in the Building 780, Missile Services Facility. Because potential emissions of all regulated pollutants from the proposed Building 780 emergency diesel generator, operating under emergency/back-up equipment status, were less than 15 tons per year, the Department determined that installation and operation of the Building 780 emergency diesel generator could be accomplished under the provisions of ARM 17.8.745.

On January 29, 2003, the Department received notice of a contested case hearing before the Montana Board of Environmental Review (Board) regarding specific conditions that were included in the Department's decision on Montana Air Quality Permit #1427-06, issued January 13, 2003. Based on the Settlement Stipulation and Order issued by the Board on March 28, 2003, several revisions were made to Permit #1427-06 prior to issuance as a final permit. A detailed discussion of these revisions is contained in Section I.D, Current Permit Action, to air quality Permit #1427-06. Permit #1427-06 replaced Permit #1427-05.

#### D. Current Permit Action

On March 25, 2004, the Department received a complete permit application to modify Malmstrom's air quality Permit #1427-06. Malmstrom proposed process changes to current operations at heating plant boilers #1 and #3. The proposed changes include the following:

- Replacement of the existing motors driving the induced draft fans with new variable frequency drive motors.
- Replacement of the existing ash unloading system with a new ash unloading system.
- Modification of exhaust gas ductwork to increase spray dryer absorber (SDA) control efficiency of sulfur dioxide (SO<sub>2</sub>) emissions.
- Installation of ductwork to provide effluent heat to the opacity monitors for the purpose of decreasing false increased opacity readings during foggy weather conditions.
- Removal of the existing 35 MMBtu/hr heat input capacity natural gas-fired burner from Boiler #1 and replacement of this burner with two 25 MMBtu/hr heat input capacity natural gas-fired low NO<sub>x</sub> burners.
- Installation of two 25 MMBtu/hr heat input capacity natural gas-fired low NO<sub>x</sub> burners on Boiler #3.
- Installation of a load simulator for the purpose of testing and evaluating the new

low NO<sub>x</sub> burners described above.

Under the terms of Permit #1427-06 and only when firing coal, Malmstrom was permitted to bypass boiler scrubber and baghouse controls until the process reached an appropriate temperature where “blinding” would not occur in the baghouse. Under the proposed modification, installation and operation of the low NO<sub>x</sub> burners (2 each in heating plant boilers #1 and #3) would provide sufficient heat to preheat the scrubber chamber and baghouse to an appropriate temperature before burning coal. After the modification, Malmstrom will have the ability to preheat the scrubber chamber and baghouse to an acceptable temperature, thus, bypassing the baghouse is no longer necessary or appropriate. Under the current permit action, the Department has removed the conditions that allow scrubber and baghouse bypass (Section II.A.7 and II.A.8 of Permit #1427-06). Therefore, after modification, Malmstrom will be required to operate the scrubbers and baghouses at all times.

As detailed in a Department internal file memorandum dated January 16, 2004, and subsequent Department correspondence to Malmstrom dated March 15, 2004, the Department determined that Malmstrom is a major source as defined under the New Source Review (NSR) permitting program. However, potential emissions from the above detailed modifications would be below the NSR – Prevention of Significant Deterioration (NSR/PSD) significance threshold for all pollutants. Therefore, the current permit action is not subject to NSR/PSD review. An emission inventory detailing potential emissions from the proposed project is included in Section IV of the permit analysis to this permit. Permit #1427-07 replaces Permit #1427-06.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT) determinations, air quality impacts, and environmental assessments, are included in the analysis associated with each change to the permit.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the ARMs and are available upon request from the Department. Upon request, the Department will provide references for locations of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1, General Provisions, including, but not limited to:

1. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emissions of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment, including instruments and sensing devices, and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.
2. ARM 17.8.106 Source Testing Protocol. Malmstrom shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual.
3. ARM 17.8.110 Malfunctions. The Department must be notified promptly by phone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation, or to continue for a period greater than 4 hours.

4. ARM 17.8.111 Circumvention. No person shall cause or permit the installation or use of any device or any means which, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant which would otherwise violate an air pollution control regulation. No equipment that may produce emissions shall be operated or maintained in such a manner that a public nuisance is created.

B. ARM 17.8, Subchapter 2, Ambient Air Quality, including, but not limited to:

1. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
2. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
3. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
4. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
5. ARM 17.8.222 Ambient Air Quality Standard for Lead
6. ARM 17.8.223 Ambient Air Quality Standard for PM<sub>10</sub>

Malmstrom must comply with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3, Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.
2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, Malmstrom shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.
3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.
4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.
5. ARM 17.8.316 Incinerators. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any incinerator, particulate matter in excess of 0.10 grains per standard cubic foot of dry flue gas, adjusted to 12% carbon dioxide and calculated as if no auxiliary fuel had been used. Further, no person shall cause or authorize to be discharged into the outdoor atmosphere from any incinerator emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes.
6. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss

control device as described in (1) of this rule.

7. ARM 17.8.340 Standard of Performance for New Stationary Sources. This rule incorporates by reference 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). The following sources are considered NSPS affected facilities under the following subparts.

Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units. This Subpart does not apply to the heating plant boilers. The units do not produce steam and, therefore, are not affected facilities.

Subpart Kb, Volatile Organic Liquid Storage Vessels. This subpart applies to tanks for which construction, reconstruction or modification commenced after July 23, 1984. The Department determined that Subpart Kb does not apply to the above ground fuel storage tanks listed in Section I.B.5 of the analysis section of this permit.

Subpart E, Standards of Performance for Incinerators. This subpart does not apply to the classified document incinerator since the incinerator has a design capacity of 5.22 tons per day, which is less than the applicability size of 50 tons per day.

Subpart Ce, Emission Guidelines and Compliance Times for Hospital/ Medical/ Infectious Waste Incinerators. This subpart does not apply because the base's medical waste incinerator has been rendered inoperable, and is no longer in service.

8. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. The source, as defined and applied in 40 CFR 63, shall comply with the requirements of 40 CFR 63, as listed below:

Subpart A, General Provisions. These rules apply to all equipment or facilities subject to a National Emission Standard for Hazardous Air Pollutants (NESHAP) for source categories as listed below:

Subpart DDDDD, NESHAPs for Industrial, Commercial, and Institutional Boilers and Process Heaters. As of the date of permit issuance, 40 CFR 63, Subpart DDDDD, has been finalized but has not been published in the Federal Register (FR). 40 CFR 63, Subpart DDDDD, will become final and effective 60 days after publishing in the FR. Since Malmstrom is a major source of HAPs (Hazardous Air Pollutants) (see Section IV of this permit analysis, HAPs Emission Inventory) and the heating plant boilers at Malmstrom meet the definition of affected units under this subpart, these units are subject to the requirements of this subpart.

In accordance with 40 CFR 63, Subpart DDDDD, the requirements contained in this subpart apply to any industrial boiler, institutional boiler and commercial boiler, and process heater operating at a major source of HAPs. For the purposes of this subpart, boiler means an enclosed device using controlled flame combustion and having the primary purpose of recovering thermal energy in the form of steam or hot water. Since the primary purpose of the heating plant boilers at the Malmstrom facility is to recover thermal energy in the form of hot water, the Department determined that these units meet the definition of affected units under 40 CFR 63, Subpart DDDDD.

D. ARM 17.8, Subchapter 5, Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. Malmstrom shall submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. Malmstrom submitted the proper application fee for the current permit action.
2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit, excluding an open burning permit, issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

The annual assessment and collection of the air quality operation fee, as described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions which pro-rate the required fee amount.

E. ARM 17.8, Subchapter 7, Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit alteration to construct, alter or use any air contaminant sources that have the Potential to Emit (PTE) greater than 25 tons per year of any pollutant. Malmstrom has the PTE more than 25 tons per year of particulate matter (PM), PM with an aerodynamic diameter less than or equal to 10 microns (PM<sub>10</sub>), oxides of nitrogen (NO<sub>x</sub>), carbon monoxide (CO), and oxides of sulfur (SO<sub>x</sub>); therefore, an air quality permit is required.
3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.
4. ARM 17.8.745 Montana Air Quality Permits—Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.
5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration or use of a source. Malmstrom submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit.

Malmstrom submitted an affidavit of publication of public notice for the March 16, 2004, issue of the *Great Falls Tribune*, a newspaper of general circulation in the Town of Great Falls in Cascade County, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.
7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.
8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.
9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving Malmstrom of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.*
10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.
11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.
12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).
13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.
  15. ARM 17.8.770 Additional Requirements for Incinerators. This rule specifies the additional information that must be submitted to the Department for incineration facilities subject to 75-2-215, Montana Code Annotated (MCA).
- F. ARM 17.8, Subchapter 8, Prevention of Significant Deterioration of Air Quality, including, but not limited to:
1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.
  2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a listed source, but emissions are greater than or equal to 250 tons per year; therefore, the facility is major. This modification will not cause a net emission increase greater than significant levels and, therefore, does not require an NSR analysis. The net emission changes are as follows:

<b>Permit #1427-07 Potential To Emit (See Section IV, Emission Inventory)</b>		
<b>Pollutant</b>	<b>Emissions Increase</b>	<b>PSD Significance Level (ton/year)</b>
<b>PM<sub>10</sub></b> *	3.33	15
<b>NO<sub>x</sub></b>	21.90	40
<b>CO</b>	36.79	100
<b>SO<sub>x</sub></b>	0.26	40

\* Assume all PM emissions resulting from natural gas combustion are PM<sub>10</sub>.

- G. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:
1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:
    - a. PTE > 100 tons/year of any pollutant;
    - b. PTE > 10 tons/year of any one HAP, PTE > 25 tons/year of a combination of all HAPs, or a lesser quantity as the Department may establish by rule; or
    - c. PTE > 70 tons/year of PM<sub>10</sub> in a serious PM<sub>10</sub> nonattainment area.
  2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #1427-07 for Malmstrom, the following conclusions were made:
    - a. The facility's PTE is greater than 100 tons/year for NO<sub>x</sub>, CO, and SO<sub>2</sub>.



- b. The facility's PTE is greater than 10 tons/year for a single HAP and greater than 25 tons/year for all HAPs.
- c. This source is not located in a serious PM<sub>10</sub> nonattainment area.
- d. This facility is subject to NSPS requirements as listed in Section II.C.7 of the permit analysis.
- e. This facility is not subject to any current (final and effective) NESHAP standard. However, after promulgation, Malmstrom will be subject to 40 CFR 63, Subpart DDDDD, NESHAPS for Industrial, Commercial, and Institutional Boilers and Process Heaters (Boiler MACT). As of the date of permit issuance, the Boiler MACT has been finalized but not published in the Federal Register (FR); therefore, the final rule is not effective. This NESHAP will become final and effective 60 days after publication in the FR. See Section II.C.8 of this permit analysis for further discussion of 40 CFR 63, Subpart DDDDD, applicability.
- f. This source is not a Title IV affected source, nor a solid waste combustion unit.
- g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that Malmstrom is subject to the Title V operating permit program. Malmstrom currently operates under Title V Operating Permit #OP1427-03, which was issued final and effective on January 6, 2004. Further, in accordance with ARM 17.8.1227, the current permit action constitutes a significant modification of Malmstrom's Title V Operating Permit #OP1427-03. Malmstrom submitted a Title V application for a significant modification to Title V Operating Permit #OP1427-03 concurrently with their Montana Air Quality Permit modification request.

### III. BACT Determination

A BACT determination is required for each new or altered source. Malmstrom shall install on the new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized.

The Department reviewed various methods for the control of NO<sub>x</sub> and CO emissions resulting from natural gas combustion technologies installed on existing boiler operations for co-firing (coal and natural gas) purposes, as well as previous BACT determinations.

Under the current permit action, Malmstrom proposes to install and operate four, 25-MMBtu/hr heat input capacity, low NO<sub>x</sub> natural gas-fired burners, two each on the existing co-fired (coal and natural gas) heating plant boilers #1 and #3. The main purpose of the installation is to ensure that Malmstrom can maintain compliance with permitted emission limits during start-up, shutdown, and malfunction situations, especially coal-fired start-up operations. Previous to the current permit action, Malmstrom was allowed to bypass the scrubbers and baghouses on the boilers during startup, until the scrubber inlet temperature reaches approximately 350° F. At temperatures below 350° F, the moisture in the lime slurry would not be completely evaporated and would cause "blinding" of the bags. Further, Malmstrom's permit requires that all emission limits be in effect during periods of scrubber and baghouse bypass. As reported in previous Facility Upset Reports, Malmstrom cannot meet the applicable emission limits for the thirty-minute period during start-up on coal when the controls are bypassed. The proposed low NO<sub>x</sub> burners would allow Malmstrom to bring the heat up to the needed temperature to maintain

baghouse and scrubber control without the need for bypass of these controls. Utilizing low NO<sub>x</sub> burners that can co-fire with coal would eliminate potential emissions exceedances during startup on coal and during spray dryer absorber (SDA) or baghouse malfunctions.

### NO<sub>x</sub> BACT Analysis

Currently, the two most prevalent combustion control techniques used to reduce NO<sub>x</sub> emissions from natural gas-fired boilers are flue gas recirculation (FGR) and low NO<sub>x</sub> burners. In an FGR system, a portion of the flue gas is recycled from the stack to the burner windbox. Upon entering the windbox, the recirculated gas is mixed with combustion air prior to being fed to the burner. The recycled flue gas consists of combustion products which act as inerts during combustion of the fuel/air mixture. The FGR system reduces NO<sub>x</sub> emissions by two mechanisms. Primarily, the recirculated gas acts as a diluent to reduce combustion temperatures, thus suppressing the thermal NO<sub>x</sub> mechanism. To a lesser extent, FGR also reduces NO<sub>x</sub> formation by lowering the oxygen concentration in the primary flame zone. The amount of recirculated flue gas is a key operating parameter influencing NO<sub>x</sub> emission rates for these systems. An FGR system is normally used in combination with specially designed low NO<sub>x</sub> burners capable of sustaining a stable flame with the increased inert gas flow resulting from the use of FGR. When low NO<sub>x</sub> burners and FGR are used in combination, these techniques are capable of reducing NO<sub>x</sub> emissions by 60 to 90 percent.

Low NO<sub>x</sub> burners reduce NO<sub>x</sub> by accomplishing the combustion process in stages. Staging partially delays the combustion process, resulting in a cooler flame, which suppresses thermal NO<sub>x</sub> formation. NO<sub>x</sub> emission reductions of 40 to 85 percent (relative to uncontrolled emission levels) have been observed with low NO<sub>x</sub> burners.

Other combustion control techniques used to reduce NO<sub>x</sub> emissions include other staged combustion techniques and gas reburning. In staged combustion (e.g., burners-out-of-service and overfire air), the degree of staging is a key operating parameter influencing NO<sub>x</sub> emission rates. Gas reburning is similar to the use of overfire in the use of combustion staging. However, gas reburning injects additional amounts of natural gas in the upper furnace, just before the overfire air ports, to provide increased reduction of NO<sub>x</sub>.

### NO<sub>x</sub> BACT Summary and Determination

As indicated in the above discussion, the proposed low NO<sub>x</sub> natural gas burners will result in a significant reduction in NO<sub>x</sub> emissions through staged combustion, as compared to uncontrolled natural gas combustion. Further, incorporation of low NO<sub>x</sub> burner technology into Boiler #1 and #3 combustion practices will result in an overall reduction of other regulated pollutants when compared to current uncontrolled coal fired boiler emissions resulting during periods of start-up, shutdown, and malfunction. Because Malmstrom proposed the use of low NO<sub>x</sub> burners for Boiler #1 and #3 co-firing purposes, and because low NO<sub>x</sub> burners are capable of significant NO<sub>x</sub> reductions, the Department determined that the installation and operation of low NO<sub>x</sub> burners constitutes BACT for NO<sub>x</sub> in this case.

### CO BACT Analysis

The rate of CO emissions from boilers depends on the efficiency of natural gas combustion. Therefore, the primary CO control for natural gas fired boilers is the use and maintenance of proper combustion practices. Improperly tuned boilers and boilers operating at off-design levels decrease combustion efficiency resulting in increased CO emissions. In some cases, the addition of NO<sub>x</sub> control systems such as low NO<sub>x</sub> burners and flue gas recirculation (FGR) may also reduce combustion efficiency, resulting in higher CO emissions relative to uncontrolled boilers.

## CO BACT Summary and Determination

As indicated in the above analysis, the primary purpose for the installation and operation of the low NO<sub>x</sub> natural gas-fired burners is to ensure that Malmstrom can maintain compliance with permitted emission limits during start-up, shutdown, and malfunction situations, especially coal-fired start-up operations. Since the low NO<sub>x</sub> units will be used primarily for start-up operations and will be used to pre-heat the flue gas to allow for proper control and reduction of pollutants, the Department determined that proper combustion techniques constitutes BACT for CO in this case.

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

### IV. Emission Inventory

An expanded emission inventory, which encompasses all emission points considered in previous permit actions, is contained in the emission inventory section for each respective permit. The primary emission units at Malmstrom are the Heating Plant Boilers, which are inventoried below. The following emission inventory also includes emission estimates for the proposed permit action.

Source	tons/year					
	PM	PM <sub>10</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC
Heating Plant Boilers	52.6	52.6	249.8	159.8	138.8	1.6
Potential emissions included in this table represent worst-case emissions regardless of fuel-type combusted.						

### Criteria Pollutants

Calculations: Based on Worst Case Fuel Combustion

Fuel consumption = 999,000 MMBTU/yr {Permit Limit}

If All Natural Gas:

Assume conservative heat content of 900 MMBtu/MMscf

$999000 \text{ MMBTU/yr} \times 0.0011 \text{ MMscf/MMBTU} = 1110 \text{ MMscf/yr}$

If All Coal:

Assume conservative heat content of 18 MMBtu/ton

$999000 \text{ MMBtu/yr} \times 0.0556 \text{ ton/MMBtu} = 55,500 \text{ tons coal/year}$

Total Particulate (Coal and Natural Gas)

Emission Factor	4	lb/hour {Permit Limit}
PM =	4.0	lb/hour * 8760 hours/year * 0.0005 ton/lb
=	17.52	tons/year per Boiler
=	52.56	tons/year

PM<sub>10</sub> (Coal and Natural Gas)

Assume all TSP is PM<sub>10</sub>

Emission Factor	4	lb/hour {Permit Limit}
PM <sub>10</sub> =	4.0	lb/hour * 8760 hours/year * 0.0005 ton/lb
=	17.52	tons/year per Boiler
=	52.56	tons/year

NO<sub>x</sub> Emissions (Coal and Natural Gas):

Emission Factor:	0.5	lb/MMBtu {Permit Limit}
Fuel Consumption:	999000 MMBtu/yr	{Permit Limit}
NO <sub>x</sub> =	0.5	lb/MMBtu * 999000 MMBtu/yr * 0.0005 ton/lb
=	249.75	ton/yr

SO<sub>2</sub> Emissions (Coal):

Emission Factor: 0.32 lb/MMBtu {Proposed Permit Limit}  
 Fuel Consumption: 999000 MMBtu/yr {Proposed Permit Limit}  
 SO<sub>2</sub> = 0.32 lb/MMBtu \* 999000 MMBtu/yr \* 0.0005 ton/lb  
 = 159.84 ton/yr

SO<sub>2</sub> Emissions (Natural Gas):

Emission Factor: 0.60 lb/MMscf {FIRE V 5.0 SCC 10200602}  
 SO<sub>2</sub> = 1110 MMscf/yr \* 0.60 lb/MMscf \* 0.0005 ton/lb  
 = 0.33 ton/yr

CO Emissions (Coal)

Emission Factor: 5.00 lb/ton coal {FIRE V 5.0 SCC 10200204}  
 CO = 55500 tons coal/year \* 5.00 lb/ton coal \* 0.0005 ton/lb  
 = 138.75 ton/yr

CO Emissions (Natural Gas)

Emission Factor: 35.00 lb/MMscf {FIRE V 5.0 SCC 10200602}  
 CO = 1110 MMscf/yr \* 35.00 lb/MMscf \* 0.0005 ton/lb  
 = 19.43 ton/yr

VOC Emissions (Coal)

Emission Factor: 0.05 lb/ton {FIRE V 5.0 SCC 10200204}  
 VOC = 55500 tons coal/year \* 0.05 lb/ton \* 0.0005 ton/lb =  
 = 1.39 ton/yr

VOC Emissions (Natural Gas)

Emission Factor: 2.80 lb/MMscf {FIRE V 5.0 SCC 10200602}  
 VOC = 1110 MMscf/yr \* 2.80 lb/MMscf \* 0.0005 ton/lb =  
 = 1.55 ton/yr

Hazardous Air Pollutants

<b>Heating Plant Boilers: HAPs Emissions</b>	
<b>Worst Case Scenario - Coal Combustion</b>	
<b>HAP</b>	<b>ton/year</b>
1,1,1-trichloroethane	4.78E-04
2-chloroacetophenone	1.67E-04
2,4-dinitrophenol	6.69E-06
5-methyl chrysene	5.26E-07
acenaphthene	1.22E-05
acenaphthylene	5.97E-06
acetaldehyde	1.36E-02
acetophenone	3.58E-04
acrolein	6.93E-03
benzene	3.11E-02
benz(a)anthracene	1.91E-06
benzo(a)pyrene	9.08E-07
benzo(b)fluoranthene	2.63E-06
benzo(g+h+l)perylene	6.45E-07
benzo(k)fluoranthene	2.63E-06
benzyl chloride	1.67E-02
biphenyl	4.06E-05
bis(2-ethylhexyl)phthalate (DEHP)	1.74E-03
bromoform	9.32E-04
carbon disulfide	3.11E-03
chlorobenzene	5.26E-04
chloroform	1.41E-03
chrysene	2.39E-06
cumene	1.27E-04
cyanide	5.97E-02

dimethyl sulfate	1.15E-03
ethyl benzene	2.25E-03
ethyl chloride	1.00E-03
ethylene dichloride	9.56E-04
ethylene dibromide	2.87E-05
fluoranthene	1.70E-05
fluorene	2.17E-05
formaldehyde	5.74E-03
hexane	1.60E-03
hydrochloric acid	2.87E+01
hydrofluoric acid	3.58E+00
indeno(1,2,3,c,d)pyrene	1.46E-06
isophrone	1.39E-02
methyl bromide	3.82E-03
methyl chloride	1.27E-02
methyl ethyl ketone (2-butanone)	9.32E-03
methyl hydrazine	4.06E-03
methyl methacrylate	4.78E-04
methyl tert butyl ether	8.36E-04
methylene chloride	6.93E-03
naphthalene	3.11E-04
penanthrene	6.45E-05
phenols	3.82E-04
polychlorinated dibenzo-p-dioxins	1.02E-06
polychlorinated dibenzo-p-furans	5.83E-06
propionaldehyde	9.08E-03
pyrene	7.89E-06
tetrachloroethylene	1.03E-03
toluene	5.74E-03
styrene	5.97E-04
xylene	8.84E-04
vinyl acetate	1.82E-04
antimony	4.30E-04
arsenic	9.80E-03
beryllium	5.02E-04
cadmium	1.22E-03
chromium	6.21E-03
cobalt	2.39E-03
lead	1.00E-02
manganese	1.17E-02
mercury	1.98E-03
nickel	6.69E-03
selenium	3.11E-02
<b>Total HAP Emissions</b>	<b>3.26E+01</b>

A complete HAPs emission inventory, including all calculations used to estimate emissions, is on file with the Department. All HAPs emission calculations estimated using emission factors from AP-42, Section 1.1 (Coal). The above table represents potential HAPs emissions resulting from the permitted heating plant allowable heat input capacity of 999,000 MMBtu/year.

### HAPs: Example Calculation

Heating Plant Heat Input Capacity: 999,000 MMBtu/year (Permit Limit)

#### Hydrochloric Acid (HCl)

Coal Combustion

Emission Factor: 1.20E+00 lb/ton (AP-42, Section 1.1, Table 1.1-15)  
 Conversion: 1.20 lb/ton coal \* 1 ton/2000 lb \* 1 lb coal/10450 Btu \* 1 MMBtu/MMBtu = 5.74E-02 lb/MMBtu  
 Calculations: 5.74E-02 lb/MMBtu \* 999,000 MMBtu/year \* 0.0005 ton/lb = 28.7 ton/year

#### Emission Inventory: Permit #1427-07 – Addition of Low NO<sub>x</sub> Burners to Boiler #1 and #3

tons per year					
Source	PM <sub>10</sub>	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>
Boiler #1: 2 – 25 MMBtu/hr NG Heaters (25 MMBtu/hr/hr)	1.66	10.95	18.40	1.20	0.13
Boiler #3: 2 – 25 MMBtu/hr NG Heaters (25 MMBtu/hr/hr)	1.66	10.95	18.40	1.20	0.13
<b>Total</b>	<b>3.33</b>	<b>21.90</b>	<b>36.79</b>	<b>2.41</b>	<b>0.26</b>

- assume all PM emissions are PM<sub>10</sub>

#### Boiler #1 (2 Heaters @ 25 MMBtu/hr/Heater)

#### Boiler #3 (2 Heaters @ 25 MMBtu/hr/Heater)

Heat Input Capacity: 25 MMBtu/hr  
 Hours of Operation: 8760 hr/yr  
 Fuel Heating Value: 0.001 MMscf/MMBtu  
 Number of Heaters: 2 Heaters/Boiler

#### PM<sub>10</sub> Emissions

Emission Factor: 7.6 lb/MMscf (AP-42 Table 1.4-2, 07/98)  
 Calculations: 7.6 lb/MMscf \* 0.001 MMscf/MMBtu \* 25 MMBtu/hr \* 2 Heaters = 0.38 lb/hr  
 0.38 lb/hr \* 8760 hr/yr \* 0.0005 ton/lb = 1.66 ton/yr

#### NO<sub>x</sub> Emissions

Emission Factor: 50 lb/MMscf (AP-42 Table 1.4-1, 07/98)  
 Calculations: 50 lb/MMscf \* 0.001 MMscf/MMBtu \* 25 MMBtu/hr \* 2 Heaters = 2.50 lb/hr  
 2.50 lb/hr \* 8760 hr/yr \* 0.0005 ton/lb = 10.95 ton/yr

#### CO Emissions

Emission Factor: 84 lb/MMscf (AP-42 Table 1.4-2, 07/98)  
 Calculations: 84 lb/MMscf \* 0.001 MMscf/MMBtu \* 25 MMBtu/hr \* 2 Heaters = 4.20 lb/hr  
 4.20 lb/hr \* 8760 hr/yr \* 0.0005 ton/lb = 18.40 ton/yr

#### VOC Emissions

Emission Factor: 5.5 lb/MMscf (AP-42 Table 1.4-2, 07/98)  
 Calculations: 5.5 lb/MMscf \* 0.001 MMscf/MMBtu \* 25 MMBtu/hr \* 2 Heaters = 0.28 lb/hr  
 0.28 lb/hr \* 8760 hr/yr \* 0.0005 ton/lb = 1.20 ton/yr

#### SO<sub>2</sub> Emissions

Emission Factor: 0.6 lb/MMscf (AP-42 Table 1.4-2, 07/98)  
 Calculations: 0.6 lb/MMscf \* 0.001 MMscf/MMBtu \* 25 MMBtu/hr \* 2 Heaters = 0.03 lb/hr  
 0.03 lb/hr \* 8760 hr/yr \* 0.0005 ton/lb = 0.13 ton/yr

## V. Air Quality Impacts

The current permit action analyzes the following changes to the heating plant boilers #1 and #3 at the Malmstrom facility:

- Replacement of the existing motors driving the induced draft fans with new variable frequency drive motors.
- Replacement of the existing ash unloading system with a new ash unloading system.
- Modification of exhaust gas ductwork to increase spray dryer absorber (SDA) control efficiency of sulfur dioxide (SO<sub>2</sub>) emissions.
- Installation of ductwork to provide effluent heat to the opacity monitors for the purpose of decreasing false increased opacity readings during foggy weather conditions.
- Removal of the existing 35 million British thermal unit per hour (MMBtu/hr) heat input capacity natural gas-fired burner from Boiler #1 and replacement of this burner with two 25 MMBtu/hr heat input capacity natural gas-fired low NO<sub>x</sub> burners.
- Installation of two 25 MMBtu/hr heat input capacity natural gas-fired low NO<sub>x</sub> burners on Boiler #3.
- Installation of a load simulator for the purpose of testing and evaluating the new low NO<sub>x</sub> burners described above.

The Department believes that the above-cited changes, collectively, will result in an overall decrease in actual pollutant emissions from the heating plant boiler operations through increased control and boiler operating efficiency. Therefore, the Department believes that the current permit action will not result in any negative impact to ambient air quality in the area. Any potential impacts would be minor and positive impacts.

#### VI. Existing Air Quality

The facility is in an area identified as attainment for all pollutants. However, the facility is located near an area that has recently been re-designated attainment for CO under a limited maintenance plan. The Malmstrom facility has not been identified in any studies as impacting the previous nonattainment area. The Department believes that the above-cited changes, collectively, will result in an overall decrease in actual pollutant emissions from the heating plant boiler operations, including CO emissions, through increased control and boiler operating efficiency. Therefore, the Department believes that the current permit action will not result in any negative impact to existing air quality in the project area.

#### VII. Taking or Damaging Implication Analysis

As required by 2-10-101 through 105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

#### VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

**DEPARTMENT OF ENVIRONMENTAL QUALITY**  
**Permitting and Compliance Division**  
**Air Resources Management Bureau**  
**P.O. Box 200901, Helena, Montana 59620**  
**(406) 444-3490**

**FINAL ENVIRONMENTAL ASSESSMENT (EA)**

*Issued To:* US Air Force - Malmstrom AFB  
341 CES/CEVC  
39 - 78th Street North  
Malmstrom AFB, MT 59402-7536

*Air Quality Permit Number:* 1427-07

*Preliminary Determination Issued:* May 3, 2004

*Department Decision Issued:* May 19, 2004

*Permit Final:* June 4, 2004

1. *Legal Description of Site:* The Malmstrom base is located primarily in Township 20 North, Range 4 and 5 East, in Cascade County. The base is contained within approximately 3,159 acres and is located on the eastern edge of the City of Great Falls.
2. *Description of Project:* The proposed permit modification would include six process changes to current operations at heating plant boilers #1 and #3. These changes include the following:
  - Replacement of existing motors driving the induced draft fans with new variable frequency drive motors;
  - Replacement of existing ash unloading system with a new ash unloading system;
  - Installation of modified boiler exhaust gas ductwork to increase spray dryer absorber (SDA) sulfur dioxide (SO<sub>2</sub>) control efficiency;
  - Installation of ductwork to provide effluent heat to the boiler opacity monitors for the purpose of decreasing false increased opacity readings during foggy weather conditions;
  - Removal of the existing 35 million British thermal unit per hour (MMBtu/hr) heat input capacity natural gas-fired burner from Boiler #1 and replacement of this burner with two 25 MMBtu/hr heat input capacity natural gas-fired low NO<sub>x</sub> burners;
  - Installation of two 25 MMBtu/hr heat input capacity natural gas-fired low NO<sub>x</sub> burners on Boiler #3; and
  - Installation of a load simulator for the purpose of testing and evaluating the new low NO<sub>x</sub> burners described above.

As detailed in a Department file memorandum dated January 16, 2004, and subsequent Department correspondence to Malmstrom dated March 15, 2004, the Department determined that Malmstrom is a major source as defined under the New Source Review – Prevention of Significant Deterioration (NSR/PSD) permitting program. However, potential emissions from the above detailed modifications would be below the NSR/PSD significance threshold for all pollutants. Therefore, the current permit action would not be subject to NSR/PSD review. An emission inventory detailing potential emissions from the proposed project would be included in Section IV of the permit analysis to the permit.



3. *Objectives of Project:* The first process change would be removing motors powering the induced draft fans and replacing them with new motors equipped with variable frequency drives. This would improve control of combustion air pressure at reduced boiler loads. The induced draft fans and dampers work together with the forced draft fans and dampers to move combustion air and flue gas. The boiler operates most efficiently and produces the least nitrogen oxide when there is a slight negative inside air pressure. The variable frequency drive motors would provide better constant air flow and control of combustion air pressure.

The second change in operations would be to remove the current ash unloader system and install an updated ash unloader system. This would provide easier operator control of fugitive dust emissions and reduce generation of excess water when transferring the fly ash from the ash silo into dumpsters.

The current ash unloader system combines water to keep dust (opacity) down. The system requires constant operator vigilance to add enough water to control dust without turning the ash into a muddy slurry mixture. The new unloader would provide better operational opacity control through improved control of the supply water and by utilizing a superior pug mill, rotary feeder, and knife gate for mixing the water with the ash.

The third operational change would be to install spray dryer absorber (SDA) inlet temperature control bypass ductwork. SDA removal of sulfur dioxide (SO<sub>2</sub>) is optimized when the flue gas temperature is in the 300°F to 350°F range. Currently, the exiting flue gas flows through an air heater that preheats the combustion air before entering the boiler. However, the air heater outlet flue gas temperature is 50° F lower than the manufacturer's predictions and below the optimum range for the SDA. Modifying the current combustion air system so that some of the flue gas bypasses the air heater it would keep the flue gas temperature above 300° F at the SDA. This change would allow Malmstrom to burn less expensive coal fuel at lower boiler loads and decrease SO<sub>2</sub> emissions.

A fourth operational enhancement would involve ducting effluent heat to the opacity monitors. Currently, during fog conditions, water vapor forms in the stack and is mistaken for particulate matter by the monitors, thus resulting in unusually high particulate matter readings. The warm effluent air would prevent the formation of the water vapor near the monitors, eliminating the erroneous readings.

The fifth operational enhancement would aid boilers #1 and #3 in staying in compliance with permit limits during start-up and malfunctions. Malmstrom would install two natural gas fired, 25-MMBtu/hr heat input capacity burners into both boiler #1 and boiler #3. These burners would be installed in opposite sidewalls of the boiler and bricking off of the grate and coal feeders would not be required for operation on natural gas. The burners would provide 40 MMBtu/hr of heat output to preheat the SDA chamber and baghouse to sufficient operating temperature before burning coal. After the coal is burning sufficiently, the natural gas burners would be retracted and a sliding steel plate would cover the opening to the burners so the boiler can operate under larger coal loads. This process would eliminate emission concerns during start-up.

This change would also eliminate malfunction concerns such as the plugging of the atomizer in the SDA. The sequence of events when there is a boiler #1 SDA or baghouse malfunction would begin with firing the natural gas burners to provide 40 MMBtu/hr heat output. The natural gas combustion flue gas would travel through boiler #1 SDA and baghouse. If there was a substantial load, boiler #2 would be started and brought on-line to provide 30 MMBtu/hr heat output. The combined output of boiler #1 on natural gas and boiler #2 on natural gas would carry a plant load of 70 MMBtu/hr. Once boiler #2 is up to load, boiler #1 would be started in order to shutdown boiler #3 for repairs. A malfunction of boiler #3 operating on coal would follow the same sequence and prevent Malmstrom from ever needing to bypass pollution control equipment.

The last proposal would be to install a load simulator. This would be used to test and validate performance of the new low NO<sub>x</sub> burner systems and their controls at the end of the project, before the heating season begins. It would also be used for emissions source testing. Source testing not only measures emissions, but also establishes the maximum load for the next two-year period. In the past, Malmstrom's scheduled source tests were often postponed due to unexpected mild winter temperatures. Also, during source tests Malmstrom had difficulty establishing and maintaining a sufficient maximum load. Unlike steam producing systems that can vent steam to produce an artificial load during mild temperatures, Malmstrom utilizes a high temperature hot water system that cannot create sufficient artificial load. With a load simulator Malmstrom would be capable of completing source tests when scheduled and test at various load levels including at maximum load.

Capitalizing on improved technology, these process changes at Malmstrom's coal-fired heat plant would provide many benefits to ensure the plant is as environmentally friendly as possible. An updated ash unloader system would improve opacity control during ash silo unloading. Rearranging ductwork to the SDA would enhance SO<sub>2</sub> removal especially at low loads. Supplying heat to the opacity monitors would prevent erroneous readings during fog conditions. Utilizing low NO<sub>x</sub> burners that can co-fire with coal would potentially eliminate emissions exceedances during startup on coal and during SDA or baghouse malfunctions. Finally, a load simulator would allow proper testing of the system both at the conclusion of the project and during air emissions source tests.

4. *Alternatives Considered:* In addition to the proposed action, the Department considered the "no-action" alternative. The "no-action" alternative would deny the proposed changes to the Malmstrom facility. However, the Department does not consider the "no-action" alternative to be appropriate because RML demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.
5. *A Listing of Mitigation, Stipulations, and Other Controls:* A list of enforceable conditions, including a BACT analysis, would be included in Permit #1427-07.
6. *Regulatory Effects on Private Property:* The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.
7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action" alternative was discussed in Section 4 of this EA.

		Major	Moderate	Minor	None	Unknown	Comments Included
<b>A</b>	Terrestrial and Aquatic Life and Habitats			X			Yes
<b>B</b>	Water Quality, Quantity, and Distribution			X			Yes
<b>C</b>	Geology and Soil Quality, Stability and Moisture			X			Yes
<b>D</b>	Vegetation Cover, Quantity, and Quality			X			Yes
<b>E</b>	Aesthetics				X		Yes
<b>F</b>	Air Quality			X			Yes
<b>G</b>	Unique Endangered, Fragile, or Limited Environmental Resources			X			Yes
<b>H</b>	Demands on Environmental Resource of Water, Air and Energy			X			Yes
<b>I</b>	Historical and Archaeological Sites				X		Yes

<b>J</b>	Cumulative and Secondary Impacts			X			Yes
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## **SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS:**

The following comments have been prepared by the Department.

### **A. Terrestrial and Aquatic life and Habitats**

The area surrounding the Malmstrom facility provides habitat for and contains many species of terrestrial wildlife. Large terrestrial species include, but are not limited to, Whitetail and Mule deer, fox, badger, and raccoon. In addition, the area provides habitat for and contains numerous varieties of smaller mammalian species and many resident and migrant bird species including, but not limited to, raptors, waterfowl, and upland game birds.

The Missouri River drainage is located approximately 1 mile north of the Malmstrom facility site. The Missouri River contains various game-fish species including, but not limited to rainbow trout, brown trout, walleye, sauger, and numerous non-game fish species.

Any impacts resulting from the proposed project to terrestrial and aquatic life and habitats would be minor because all proposed activities would take place within the defined Malmstrom base, an existing industrial site. Further, minor impact to the surrounding area from the air emissions (see Section V of the permit analysis) would be realized due to dispersion of pollutants. As previously discussed, terrestrials would use the general area of the facility. However, the area around the base is fenced to limit access to the facility. The fencing would likely not restrict access from all animals that frequent the area, but may discourage some animals from entering the base property. Further, because the facility is an existing industrial site, terrestrials that routinely inhabit the area are accustomed to the industrial character of the facility. In addition, because Malmstrom is not proposing to directly discharge any material to surface or ground water sources in the area, aquatic life and habitats would realize little or no impact from the proposed changes.

The proposed project includes the installation and operation of equipment that would result in air pollutant emissions. However, as discussed in Section 3 of this EA, the major objective of the project would be to reduce actual pollutant emissions by allowing the facility to maintain air quality controls during start-up and malfunction operations. The emitting units added would combust natural gas in place of current boiler start-up operations combusting coal. In general, the combustion of natural gas results in significantly lower air pollutant emissions when compared to coal combustion. Since the proposed changes would likely result in a reduction in actual pollutant emissions through increased air pollution control capabilities and the combustion of lower polluting fuel during start-up operations, the Department determined that any impacts to air quality would be minor and likely would be positive. The small amount of air impact would correspond to an equally small amount of deposition. Overall, any impact to terrestrial and aquatic life and habits from the proposed project would be minor.

### **B. Water Quality, Quantity and Distribution**

The proposed project would not result in any impacts to water quantity or distribution in the area of operation because none of the proposed changes would require additional water for proper operation nor would any of the proposed equipment require discharge to any area surface water resource.

The proposed project includes the installation and operation of equipment that would result in air pollutant emissions. However, as discussed in Section 3 of this EA, the major objective of the project would be to reduce actual pollutant emissions by allowing the facility to maintain air quality controls during start-up and malfunction operations. The emitting units added would

combust natural gas in place of current boiler start-up operations combusting coal. In general, the combustion of natural gas results in significantly lower air pollutant emissions when compared to coal combustion. Since the proposed changes would likely result in a reduction in actual pollutant emissions through increased air pollution control capabilities and the combustion of lower polluting fuel during start-up operations, the Department determined that any impacts to water quality due to the deposition of air pollutants would be minor and likely would be positive. Overall, any impact to water quality, quantity, and distribution from the proposed project would be minor.

#### C. Geology and Soil Quality, Stability and Moisture

The proposed project would not result in any impacts to the geology and soil quality, stability, and moisture from this facility because the project would not require the construction of any new buildings. Further, because all the proposed changes would take place within an existing industrial site it is unlikely that any new activities would impact soil quality, stability, and moisture.

The proposed project includes the installation and operation of equipment that would result in air pollutant emissions. However, as discussed in Section 3 of this EA, the major objective of the project would be to reduce actual pollutant emissions by allowing the facility to maintain air quality controls during start-up and malfunction operations. The emitting units added would combust natural gas in place of current boiler start-up operations combusting coal. In general, the combustion of natural gas results in significantly lower air pollutant emissions when compared to coal combustion. Since the proposed changes would likely result in a reduction in actual pollutant emissions through increased air pollution control capabilities and the combustion of lower polluting fuel during start-up operations, the Department determined that any impacts to soil quality due to the deposition of air pollutants would be minor and likely would be positive. Overall, any impact to the geology and soil quality, stability, and moisture from the proposed project would be minor.

#### D. Vegetation Cover, Quantity, and Quality

The proposed permit action would not require any new building construction or ground disturbance; therefore, the project would not result in any impact to the vegetation quantity and cover in the base area. Overall, any impact to the vegetation cover, quantity, and quality of the proposed project area would be minor.

The proposed project includes the installation and operation of equipment that would result in air pollutant emissions. However, as discussed in Section 3 of this EA, the major objective of the project would be to reduce actual pollutant emissions by allowing the facility to maintain air quality controls during start-up and malfunction operations. The emitting units added would combust natural gas in place of current boiler start-up operations combusting coal. In general, the combustion of natural gas results in significantly lower air pollutant emissions when compared to coal combustion. Since the proposed changes would likely result in a reduction in actual pollutant emissions through increased air pollution control capabilities and the combustion of lower polluting fuel during start-up operations, the Department determined that any impacts to vegetation quality due to the deposition of air pollutants would be minor and likely would be positive. Overall, any impact to the vegetation cover, quantity, and quality of the proposed project area would be minor.

#### E. Aesthetics

The proposed changes would include the installation and operation of new equipment within the existing Malmstrom base. However, because the proposed project and equipment installations would be located in a previously disturbed industrial location surrounded by the remainder of the Malmstrom base, any aesthetic impacts would be minor and consistent with current land use in the area.

The facility would be visible from various locations in the Great Falls area including, but not limited to, residential homes on base and communities surrounding the base. However, none of the proposed changes would result in noticeable deviation from existing base operations and practices. Therefore, the proposed project would not result in any impact to the visible aesthetic nature of the area.

Further, the proposed project would not result in additional noise in the area. The noise impacts from this facility on the surrounding area would be minor because the proposed equipment would be housed in existing structures located within the Malmstrom property boundary thus minimizing potential noise impacts due to the distance between the facility and the surrounding residences. In addition, any noise impacts would be consistent with similar noise impacts currently in place at the Malmstrom facility.

It is not expected that the area would receive any appreciable increase in vehicle use and travel. The facility would be located very near to existing truck routes and to other industrial facilities that currently use the route. Vehicles would likely use the existing roads in the area en route to the roads established as part of the actual facility. Visible emissions from access roads (whether the county's responsibility or Malmstrom's responsibility) would be limited to 20% opacity.

Overall, any aesthetic impact from the proposed project would be minor and similar to existing impacts resulting from current Malmstrom operations.

#### F. Air Quality

Under the current permit action, Malmstrom proposed the addition of equipment that would result in the potential increase in emissions of PM, PM<sub>10</sub>, NO<sub>x</sub>, VOC, CO, and SO<sub>x</sub> from the permitted facility. However, as indicated in Section 3 of this EA, the major objective of the proposed project would be to decrease actual plant air pollutant emissions through greater utilization of existing air pollution controls and increased combustion of cleaner burning fuels. Therefore, the air quality impacts from the proposed project would be minor. Permit #1427-07 would include conditions limiting emissions of these pollutants from the various emitting units proposed under the current permit action, as applicable. In the view of the Department, because the proposed project will likely result in a decrease in actual heating plant pollutant emissions, the proposed project would not cause or contribute to an exceedance of any applicable NAAQS/MAAQS. Overall, any impacts to air quality from the proposed project would be minor and likely positive.

#### G. Unique Endangered, Fragile, or Limited Environmental Resources

The proposed project includes the installation and operation of equipment that would result in air pollutant emissions. However, as discussed in Section 3 of this EA, the major objective of the project would be to reduce actual pollutant emissions by allowing the facility to maintain air quality controls during start-up and malfunction operations. The emitting units added would combust natural gas in place of current boiler start-up operations combusting coal. In general, the combustion of natural gas results in significantly lower air pollutant emissions when

compared to coal combustion. Since the proposed changes would likely result in a reduction in actual pollutant emissions through increased air pollution control capabilities and the combustion of lower polluting fuel during start-up operations, the Department determined that any impacts to any existing unique endangered, fragile, or limited environmental resource due to the deposition of air pollutants would be minor and likely would be positive. Overall, any impact to any existing unique endangered, fragile, or limited environmental resource in the proposed project area would be minor.

#### H. Demands on Environmental Resource of Water, Air, and Energy

The proposed project would not result in any increased demand for the environmental resource of water because operation of the proposed equipment would not require additional water use for normal operations. Further, as detailed in Section 3 of this EA, project impacts on air resources in the proposed project area would be minor due to a likely decrease in actual pollutant emissions. Finally, the proposed new low NO<sub>x</sub> burners would be “fired” with natural gas and normally used only during start-up and malfunction situations thereby requiring very little actual operation and subsequently very little natural gas consumption. Further, Permit #1427-07 would maintain a limit on the total allowable heat input (Btus fired) facility-wide. The low NO<sub>x</sub> burner operating practice limits and the existing permit conditions limiting facility-wide fuel consumption would result in little demand for energy from the proposed project. Overall, any demands for environmental resources of water, air, and energy would be minor.

#### I. Historical and Archaeological Sites

The proposed project would not result in any impact to any existing historical and archaeological sites in the proposed project area because the proposed new equipment would operate within an existing industrial area and would not require any additional construction outside of the property boundary. Also, according to previous correspondence from the Montana State Historic Preservation Office, there is low likelihood of any disturbance to any known archaeological or historic site, given previous industrial disturbance within a given area. Therefore, the proposed project would not impact any known historic or archaeological site that may be located within or near the base.

#### J. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from the proposed project on the physical and biological resources of the human environment in the immediate area would be minor due to the fact that the predominant use of the surrounding area would not change as a result of the proposed project. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #1427-07.

8. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The “no-action” alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores				X		Yes
B	Cultural Uniqueness and Diversity				X		Yes
C	Local and State Tax Base and Tax Revenue			X			Yes
D	Agricultural or Industrial Production				X		Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities				X		Yes
G	Quantity and Distribution of Employment			X			Yes
H	Distribution of Population			X			Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity			X			Yes
K	Locally Adopted Environmental Plans and Goals				X		Yes
L	Cumulative and Secondary Impacts			X			Yes

**SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.**

- A. Social Structures and Mores  
B. Cultural Uniqueness and Diversity

The proposed project would not have any impact on the social structures and mores or the cultural uniqueness and diversity of the proposed area of operation because the project would include adding equipment to the permitted facility to facilitate operations similar to existing operations at the Malmstrom facility. The predominant use of the surrounding area would not change as a result of the proposed project.

- C. Local and State Tax Base and Tax Revenue

The proposed project would result in only a minor impact the local and state tax base and tax revenue because the project would only slightly change current practices at the facility. Any economic impact to the area would be minor because the proposed project would not change typical operations at the facility. Further, the project would require only a limited amount of new construction and only a limited number of existing employees/operators and likely no new employees would be required for normal operations of the proposed equipment. Overall, any impact to local and state tax base and tax revenue would be minor as a result of the installation and operation of the proposed new equipment at the facility.

- D. Agricultural or Industrial Production

Because the proposed project would operate within the existing Malmstrom base and the limited amount of additional construction required for the project would occur within the boundaries of the base, the project would not impact or displace any land used for agricultural production. Further, the nature of the project would not result in additional industrial production. Overall, the proposed

project would not result in any impact to agricultural or industrial production at Malmstrom or in the area surrounding Malmstrom.

E. Human Health

The Clean Air Act (CAA), which was last amended in 1990, requires EPA to set NAAQS for pollutants considered harmful to public health and the environment. The federal Clean Air Act established two types of NAAQS, Primary and Secondary. Primary Standards are limits set to protect public health, including, but not limited to, the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary Standards are limits set to protect public welfare, including, but not limited to, protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Permit #1427-07 would contain conditions and limitations that would require compliance with all applicable national and state air quality standards, including the federal primary and secondary standards. Therefore, because the proposed project would result in an increase in air pollutants but would require compliance with the NAAQS/MAAQS any impact to human health would be minor.

F. Access to and Quality of Recreational and Wilderness Activities

Because the proposed project would operate within the existing Malmstrom base, the project would not impact any access to or quality of any recreation or wilderness activities in the area.

G. Quantity and Distribution of Employment

H. Distribution of Population

The installation and operation of the proposed new equipment at the Malmstrom base would utilize existing Malmstrom personnel for operations and would likely not require any new or only a limited amount of new employment. Therefore, the proposed project would have little or no impact on the quantity and distribution of employment and population in the area.

I. Demands for Government Services

Government services would be required for acquiring the appropriate permits from government agencies. In addition, the permitted source of emissions would be subject to periodic inspections by government personnel. Demands for government services would be minor.

J. Industrial and Commercial Activity

The proposed project would result in only minor impact on local industrial and commercial activity because the proposed project would be similar to existing activity at the Malmstrom facility and would operate within the existing Malmstrom base. Further, the proposed project would require only a small amount of new construction and would not result in additional industrial production.

K. Locally Adopted Environmental Plans and Goals

The Malmstrom facility is located near an area that has recently been re-designated attainment for CO under a limited maintenance plan. The Malmstrom facility has not been identified in any studies as impacting the previous nonattainment area. The Department believes that the proposed changes, collectively, would result in an overall decrease in actual pollutant emissions from the heating plant boiler operations, including CO emissions, through increased control and boiler operating efficiency. Therefore, the Department believes that the current permit action would result in only minor and potentially positive impact to existing air quality in the project area.



The Department is not aware of any other locally adopted environmental plans or goals in the immediate area affected by the proposed project. The state standards would be protective of the proposed project area.

L. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from the proposed project on the economic and social resources of the human environment in the immediate area would be minor due to the fact that the predominant use of the surrounding area would not change as a result of the proposed project. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #1427-07.

*Recommendation:* No EIS is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permit action is for the addition and modification of various equipment at the Malmstrom heating plant. Permit #1427-07 would include conditions and limitations to ensure the facility would operate in compliance with all applicable rules and regulations. In addition, as detailed in the above EA there are no significant impacts associated with the proposed project.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program

Individuals or groups contributing to this EA: Department of Environmental Quality – Air Resources Management Bureau, Montana Historical Society – State Historic Preservation Office.

EA prepared by: M. Eric Merchant, MPH

Date: April 23, 2004